Amendments to the Claims

Claims 1-9 and 18-20 are provisionally withdrawn with traverse. Claims 10-17 are elected and 12 new claims also drawn to the method are added.

Claims 1-9 are provisionally withdrawn:

1. [Withdrawn] A composition comprising a first compound including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine group and a second compound containing a non-shielded purine or pyrimidine group bound to a portion of the metal atoms and/or ions.

2. [Withdrawn] The composition of claim 1, wherein the second compound is selected from the group of RNA, single stranded DNA, and other molecules having a non-shielded purine and/or pyrimidine moiety or group.

3. [Withdrawn] An immobilized metal affinity chromatography (IMAC) column comprising a packing including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety or group and a compound containing a non-shielded purine or pyrimidine moiety or group bound to a portion of the metal atoms and/or ions.

4. [Withdrawn] A substrate comprising a plurality of ligands bonded thereto, each ligand immobilizing a metal atom and/or ion capable of binding compounds containing a non-shielded purine or pyrimidine moiety or group, and a compound containing a non-shielded purine or pyrimidine moiety or group bound to a portion of the metal atoms and/or ions.

5. [Withdrawn] The substrate of claim 4, wherein the second compound is selected from the group of RNA, single stranded DNA, and other molecules having a non-shielded purine and/or pyrimidine moiety or group.

6. [Withdrawn] An apparatus comprising a sample input unit, a separation unit, a detector unit and an analyzer unit.

7. [Withdrawn] The apparatus of claim 6, wherein the separation unit is a zone comprising an IMAC matrix including metal atoms, metal ions or mixtures thereof capable of binding compound having a non-shielded purine moiety, pyrimidine moiety or mixture thereof.

8. [Withdrawn] An apparatus comprising a substrate having an IMAC ligand coated thereon, bonded thereto, deposited thereon or deposited therein, where the substrate is adapted to remove contaminating compounds including a non-shielded purine moiety, pyrimidine moiety, or mixture thereof from target compounds including a shielded purine moiety, pyrimidine moiety, or mixture thereof.

9. [Withdrawn] The apparatus of claim 8, wherein the substrate is selected from the group consisting of a porous stirrer, a filter, a membrane, an interior wall of a vessel, or mixtures thereof.

Original Claims 10-17 are elected:

10. [Original] A method for separating compounds comprising the step of:

contacting a solution comprising compounds including a non-shielded purine or pyrimidine moiety and compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety to form a supernatant liquid having a reduced amount of compounds including a non-shielded purine or pyrimidine moiety.

11. [Original] The method of claim 10, further comprising the step of:

separating the supernatant liquid from the solid composition.

12. [Original] A method for separating compounds comprising the steps of:

passing a solution comprising a mixture of compounds including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof through a column including an IMAC ligand, where the ligand is capable of differentially binding the compounds; and

collecting purified samples of each compound.

13. [Original] The method of claim 12, further comprising the step of:

detecting each compound in an effluent from the column as a function of time from at least one detectable property associated with each compound; and

determining the identity of each compound from the detected properties.

14. [Original] A method for purifying food stuffs containing purine and/or pyrimidine moieties comprising the steps of:

forming a crude food stuff comprising cellular constituents including digestable proteins and nucleic acid contaminants including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof;

contacting the food stuff with substrate comprising an IMAC ligand, where the substrate binds the nucleic acid contaminants; and

removing the substrate comprising the IMAC ligand having bound thereto the nucleic acid contaminants to form a purified food stuff.

15. [Original] The method of claim 14, further comprising the step of

treating the crude food stuff with a DNAse, endo or exo nuclease or other nucleic acid digestion enzyme or agent prior to the contacting step.

16. [Original] A method for purifying a crude compound containing a non-shielded purine and/or pyrimidine moiety comprising the steps of:

forming a crude mixture comprising a target compound and contaminants;

contacting the crude mixture with an agent including an IMAC ligand capable of binding to the target compound to form an IMAC ligand complex;

separating the complex from the contaminants; and

recovering the compound from the complex.

17. [Original] The method of claim 16, wherein the compound is an AIDs drugs selected from the group consisting of AZT or DDI, co-enzyme A, or mixtures thereof.

Claims 18-20 are provisionally withdrawn:

18. [Withdrawn] An assay comprising the steps of:

contacting a microplate substrate comprising wells coated with a composition comprising a IMAC-oligonucleotide complex including an IMAC ligand and a single stranded oligonucleotide having a first molecular and/or atomic tag bound to the IMAC ligand; and

contacting a nucleic acid sequence including a second molecular and/or atomic tag with the IMAC-oligonucleotide complex; and

measuring a change in fluorescence when the nucleic acid sequence includes a complimentary subsequence to oligonucleotide due to an interaction between the first and second molecular and/or atomic tags.

19. [Withdrawn] The assay of claim 18, wherein the first tag is a fluorophore and the second tag is a quencher for the fluorophore.

20. [Withdrawn] An assay comprising the steps of contacting a substrate comprising a surface coated with a composition comprising an IMAC ligand and a first fluorophore with an oligonucleotide including a second fluorophore and measuring an effective Stoke shift such that a large effective Stoke shift signifies oligonucleotide binding to the coated substrate and a normal effective Stoke shift signifies no oligonucleotide binding to the coated substrate.

Claims 21 - 33 are added:

21. [New] A method for separating compounds comprising the step of:

contacting a solution comprising compounds including a non-shielded purine or pyrimidine moiety and compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety to form a supernatant liquid having a reduced amount of compounds including a non-shielded purine or pyrimidine moiety;

22. [New] A method according to Claim 21 further comprising the steps of:

separating the supernatant liquid from the solid composition; or further comprising the steps of:

separating the supernatant liquid from the solid composition and

eluting the compounds including a non-shielded purine or pyrimidine moiety from the solid composition.

23. [New] A method for separating compounds comprising the step of:

contacting a solution comprising compounds including a non-shielded purine or pyrimidine moiety and compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety to form a supernatant liquid having a reduced amount of compounds including a non-shielded purine or pyrimidine moiety.

wherein the compounds including a non-shielded purine or pyrimidine moiety comprise a nucleoside, a nucleotide, a single stranded nucleic acid oligomer, or a single stranded nucleic aid polymer and the compounds including a shielded purine or pyrimidine moiety comprise double stranded nucleic acid oligomers or double stranded nucleic acid polymers; or wherein the supernatant liquid comprises compounds including a shielded purine or pyrimidine moiety having less than or equal to 5% by weight compounds including a non-shielded purine or pyrimidine moiety.

24. [New] A method of Claim 22 wherein the supernatant liquid comprises compounds including a shielded purine or pyrimidine moiety having less than or equal to 1% by weight compounds including a non-shielded purine or pyrimidine moiety;

25. . [New] A method of Claim 22 wherein the supernatant liquid comprises compounds including a shielded purine or pyrimidine moiety having less

than or equal to 0.01% by weight compounds including a non-shielded purine or pyrimidine moiety.

26. [New] A method for making multisubstrate columns comprising the step of running a small amount of IMAC ligand onto an activated column and then flooding the rest of the column with at least one additional ligand or stationary phase.

27. [New] A method for separating compounds comprising the steps of:

passing a solution comprising a mixture of compounds including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof through a column including an IMAC ligand, where the ligand is capable of differentially binding the compounds; and

collecting purified samples of each compound;

28. [New] A method of Claim 10 further comprising the step of:

detecting each compound in an effluent from the column as a function of time from at least one detectable property associated with each compound; and

determining the identity of each compound from the detected properties.

29. [New] A method of Claim 26 wherein the mixture of compounds comprises poly(A) tailed mRNA sequences and other mRNA sequences from eukaryotic cells, where the poly(a) mRNA sequences elute after the other mRNA sequences; or wherein the mixture for compounds comprises denatured nucleic acid sequences, where sequences having A rich regions

elute after sequences having T rich regions so that complementary strands can be resolved.

30. [New] A method of Claim 27 wherein the mixture for compounds comprises denatured nucleic acid sequences, where sequences having C rich regions elute after sequences having G rich regions so that complementary strands can be resolved; or wherein the mixture of compounds comprises denatured nucleic acid sequences having A-C, A-G, A-C-G, T-G, T-C and or T-G-C rich regions so that the sequences having thee A-C, A-G, and/or A-C-G rich regions elute after their complementary sequences having T-G, T-C and or T-G-C rich regions resulting in a resolution of complementary sequences.

31. [New] A method for purifying food stuffs containing purine and/or pyrimidine moieties comprising the steps of:

forming a crude food stuff comprising cellular constituents including digestable proteins and nucleic acid contaminants including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof;

contacting the food stuff with substrate comprising an IMAC ligand, where the substrate binds the nucleic acid contaminants; and

removing the substrate comprising the IMAC ligand having bound thereto the nucleic acid contaminants to form a purified food stuff; further comprising the step of

treating the crude food stuff with a DNAse, endo or exo nuclease or other nucleic acid digestion enzyme or agent prior to the contacting step.

32 . [New] A method for purifying a crude compound containing a non-shielded purine and/or pyrimidine moiety comprising the steps of:

forming a crude mixture comprising a target compound and contaminants;

contacting the crude mixture with an agent including an IMAC ligand capable of binding to the target compound to form an IMAC ligand complex;

separating the complex from the contaminants; and

recovering the compound from the complex.

33. [New] A method of Claim 32 wherein the compound is an AIDs drug selected from the group consisting of AZT or DDI, co-enzyme A, or mixtures thereof.